

## CLAIMS

We claim:

1. A foldover apparatus for use downstream of an interfolding apparatus to receive a stack of interfolded sheets, the foldover apparatus comprising:

5 a conveyor adapted to support the stack and move the stack of interfolded sheets in the downstream direction;

a forming plow fixed relative to the conveyor; and

10 a vacuum assembly adapted to separate at least a portion of at least one top sheet of the interfolded stack from the remaining portion of the stack, and adapted to release the portion of the at least one top sheet into contact with the forming plow, the portion of the at least one top sheet being folded over by the forming plow as the stack moves in the downstream direction.

15 2. The foldover apparatus of claim 1, further comprising a perforated belt in communication with the vacuum assembly.

3. The foldover apparatus of claim 2, wherein the belt is inclined relative to the conveyor.

20 4. The foldover apparatus of claim 1, wherein the vacuum assembly has an adjustable vacuum strength.

5. The foldover apparatus of claim 1, wherein the vacuum assembly includes a vacuum chamber.

6. The foldover apparatus of claim 1, wherein the conveyor includes a guide plate.

30 7. The foldover apparatus of claim 1, wherein the forming plow is curved.

8. The foldover apparatus of claim 1, wherein the forming plow is substantially helical in shape.

9. The foldover apparatus of claim 1, wherein the portion of at least one top sheet of the interfolded stack includes an edge of the at least one top sheet.

5 10. The foldover apparatus of claim 9, wherein the edge of the at least one top sheet is the folded edge.

11. The foldover apparatus of claim 1, wherein the portion of at least one top sheet includes portions of two top sheets.

12. A foldover apparatus for use downstream of an interfolding apparatus to receive a stack of interfolded sheets, the foldover apparatus comprising:

5 a conveyor adapted to support the stack and to move the stack of interfolded sheets in the downstream direction;

a vacuum assembly adapted to separate a portion of at least one top sheet of the interfolded stack from the remaining portion of the stack and move the portion of the at least one top sheet in the downstream direction; and

10 a forming plow extending along a portion of one of the conveyor and the vacuum assembly, the vacuum assembly configured to move the portion of the at least one top sheet on one side of the forming plow and the conveyor configured to move the remaining portion of the stack on the opposite side of the forming plow such that continued downstream motion of at least one of the vacuum assembly and the conveyor causes the portion of the at least one top sheet 15 to be folded over by the folding plow.

13. The foldover apparatus of claim 12, wherein the vacuum assembly includes a vacuum chamber.

20 14. The foldover apparatus of claim 12, wherein the vacuum assembly has an adjustable vacuum strength.

15. The foldover apparatus of claim 12, further comprising a perforated belt coupled to the vacuum assembly.

25 16. The foldover apparatus of claim 15, wherein the perforations on the belt are positioned to lift a desired portion of the at least one top sheet.

17. The foldover apparatus of claim 16, wherein the desired portion of 30 the at least one top sheet is the folded edge of the at least one top sheet.

18. The foldover apparatus of claim 15, wherein the belt is inclined relative to the conveyor.

19. The foldover apparatus of claim 12, wherein the forming plow is curved.

20. The foldover apparatus of claim 12, wherein the forming plow is  
5 substantially helical in shape.

21. The foldover apparatus of claim 12, wherein the portion of the at least one top sheet includes portions of two sheets.

22. A method of folding over a portion of at least one top sheet in an interfolded stack of sheets, the method comprising:

5 providing a stack of interfolded sheets;

moving the stack of sheets downstream along a path;

separating the portion of the at least one top sheet from the remaining portion of the stack of interfolded sheets;

10 moving the portion of the at least one top sheet adjacent a forming plow;

releasing the portion of the at least one top sheet into contact with the forming plow;

15 moving the portion of the at least one top sheet along the forming plow; and

folding over the portion of the at least one top sheet.

15 23. The method of claim 22, wherein separating the portion of the at least one top sheet includes separating the portion by applying a vacuum to the portion of the at least one top sheet.

20 24. The method of claim 23, wherein applying a vacuum to the portion of the at least one top sheet includes applying a variable strength vacuum to the portion of the at least one top sheet.

25 25. The method of claim 22, wherein separating the portion of the at least one top sheet includes separating a folded edge of the at least one top sheet from the remaining portion of the stack.

30 26. The method of claim 22, wherein separating the portion of the at least one top sheet from the remaining portion of the stack of interfolded sheets includes moving the portion of the at least one top sheet along an inclined path.

27. The method of claim 22, wherein releasing the portion of the at least one top sheet into contact with the forming plow includes releasing the portion of the at least one top sheet onto the forming plow.

28. The method of claim 22, wherein moving the portion of the at least one top sheet along the forming plow includes moving the portion of the at least one top sheet along a substantially helical path.

29. A method of folding over a portion of at least two top sheets in an  
interfolded stack of sheets, the method comprising:

5 providing a stack of interfolded sheets;

moving the stack of sheets downstream along a path;

separating the portion of the at least two top sheets from the  
remaining portion of the stack of interfolded sheets;

10 moving the portion of the at least two top sheets adjacent a forming  
plow;

releasing the portion of the at least two top sheets into contact with  
the forming plow;

15 moving the portion of the at least two top sheets along the forming  
plow; and

folding over the portion of the at least two top sheets.

15 30. The method of claim 29, wherein separating the portion of the at  
least two top sheets includes separating the portion by applying a vacuum to the  
portion of the at least two top sheets.

20 31. The method of claim 30, wherein applying a vacuum to the portion  
of the at least two top sheets includes applying a variable strength vacuum to the  
portion of the at least two top sheets.

25 32. The method of claim 29, wherein separating the portion of the at  
least two top sheets includes separating a folded edge of the at least two top sheets  
from the remaining portion of the stack.

30 33. The method of claim 29, wherein separating the portion of the at  
least two top sheets from the remaining portion of the stack of interfolded sheets  
includes moving the portion of the at least two top sheets along an inclined path.

34. The method of claim 29, wherein releasing the portion of the at  
least two top sheets into contact with the forming plow includes releasing the  
portion of the at least two top sheets onto the forming plow.

35. The method of claim 29, wherein moving the portion of the at least two top sheets along the forming plow includes moving the portion of the at least two top sheets along a substantially helical path.

36. A method of folding over a portion of at least one top sheet in an interfolded stack of sheets, the method comprising:

5 providing a stack of interfolded sheets;

moving the stack of sheets downstream along a path;

separating a portion of at least one top sheet from the remaining portion of the stack of interfolded sheets;

10 moving the portion of the at least one top sheet in the downstream direction on a first side of a forming plow;

moving the remaining portion of the stack of interfolded sheets in the downstream direction to a second, opposite side of the forming plow;

15 releasing the portion of the at least one top sheet on the first side of the forming plow;

moving the portion of the at least one top sheet along the forming plow; and

15 folding over the portion of the at least one top sheet.

37. The method of claim 36, wherein separating a portion of the at least one top sheet includes applying a vacuum to the portion of the at least one top sheet.

20 18. The method of claim 37, wherein applying a vacuum to the portion of the at least one top sheet includes applying a variable strength vacuum to the portion of the at least one top sheet.

25 39. The method of claim 36, wherein separating the portion of the at least one top sheet includes separating a portion of at least two top sheets.

40. The method of claim 36, wherein separating the portion of the at least one top sheet includes lifting the portion of the at least one top sheet.

30 41. The method of claim 36, wherein separating a portion of the at least one top sheet includes separating a folded edge of the at least one top sheet from the remaining portion of the stack.

42. The method of claim 36, wherein releasing the portion of the at least one top sheet onto the forming plow includes releasing the portion of the at least one top sheet onto a top surface of the forming plow.

5 43. The method of claim 36, wherein moving the portion of the at least one top sheet along the forming plow includes moving the portion of the at least one top sheet along a substantially helical path.